THAMNOPHILUS HYPERYTHRUS, Gould.

Crown and sides of the head, all the upper surface and tail, slaty-black; wings brownish-black, with a spot of white at the tip of each of the coverts, forming three semicircular rows across the wing; chin, breast and abdomen rich dark chestnut-red, gradually blending on the flanks and vent into the dark hue of the upper surface; bill black; feet olive-brown.

Total length, 7 inches; bill, 1; wing, $3\frac{1}{8}$; tail, $2\frac{1}{2}$; tarsi, 1.

Hab. Chamicurros in Peru.

Remark.—I believe the above to be the description of a female.

XXXIV.—*On the Impregnation and Germination of the Algæ.* By Dr. PRINGSHEIM.

To the Editors of the Annals of Natural History.

GENTLEMEN, April 25, 1855.

THE author having forwarded me a copy of the *resumé* of his researches lately laid before the Berlin Academy, with a request that I will make them known in England, I have drawn up a brief abstract of them, and beg to offer this for insertion in your pages.

I am, Gentlemen, yours very truly,
ARTHUR HENFREY.

VAUCHERIA.

Besides the large ciliated zoospore, so fully described by Unger and others, the *Vaucheriæ* possess organs, known by the names of *capsules* or *sporanges* and *horns*. These were regarded by Vaucher as sexual organs, and he believed that the horns performed the functions of anthers, stating that they emitted a dust-like product, which he compared to the pollen of Phanerogamia, and imagined to exert a fertilizing influence upon the contents of the sporanges. This view has been contested by subsequent authors, some of whom have stated that a *conjugation* takes place, between the horn and the sporange, analogous to that seen in *Zygnema*, &c. Karsten (Botan. Zeitung, 1852, p. 89) has given an elaborate description of such a process. Dr. Pringsheim believes that Vaucher approached nearest to the truth, and states that the supposed conjugation is altogether imaginary. According to his recent researches, the horn is really an *antheridium*, since its contents become converted into spermatozoids, bodies which when in motion appeared stick-shaped, but when allowed to come gradually to rest, presented the appearance of minute clear vesicles, 1–180 of a line in dia-

meter, and furnished with two unequal cilia. Contemporaneously with the development of the spermatozoids in the horns, the contents of the capsules, or spore-fruits, become accumulated towards the beak-like summit, which opens at the same time that the spermatozoids are set free by the bursting of the membrane at the apex of the horn. Vast numbers of these little bodies make their escape, some already free, others engaged in mucus. The free ones spread in all directions with a rapid movement; great numbers, twenty, thirty or more, make their way into the opening of the spore-fruit, coming into contact with the tough mucilaginous layer bounding the contents. After a time a distinct membrane appears all over the mass of contents of the spore-fruit, converting them into a free cell, the spore, and the author states that he several times saw a largeish colourless corpuscle *inside* the mucilaginous coat of the contents; he believes this to have been a spermatozoid which had penetrated into the mass. The process as here described is therefore the impregnation of a mass of contents by a spermatozoid, and *a subsequent formation of the cell-membrane of the spore.* An important incidental point here is the confirmation of the view recently set forth by the author, that the primordial utricle of Mohl, the protoplasmic layer forming the external boundary of the mass of contents, does not exercise a secreting function, producing the cellular membrane on its surface, but becomes actually *transformed into the latter**

The new spore does not at once fall from the parent plant; its green contents grow paler and at last become colourless, with the exception of one or more largeish dark brown bodies. When it has totally lost its colour, it falls away through the decomposition of the membrane of the spore-fruit. Some months later the spore again resumes its green colour, germinates and grows out into a filament resembling the parent.

Fucus vesiculosus.

The author next gives an account of his observations on the impregnation of *Fucus,* which agree with those lately published by Thuret in the 'Annales des Sciences Naturelles.' The process closely resembles that just described in *Vaucheria* in its essentials, since it consists of the advent of a quantity of spermatozoids to a spore, at that moment consisting of a protoplasmic mass clothed only by its primordial utricle, the penetra-

* This view is elaborately worked out in his recent work, 'Untersuchungen über den Bau und die Bildung der Pflanzenzelle, part 1. Berlin, 1854.

tion of the spermatozoids into the mass, and the *subsequent* formation of the cellulose coat of the spore.

[These observations render necessary a careful re-examination of the impregnation in the higher plants. It is by no means certain that the so-called germinal vesicles in the embryo-sac of the flowering plants possess a cellulose coat before the influence of the pollen-tubes has been exerted. This point was not ascertained in my observations on *Orchis morio*; and I have observed appearances since, in *Santalum album* and other plants, which render it probable that the germinal bodies are only globular masses of protoplasm at the moment of impregnation.—A. H.]

Florideæ.

The interpretation of the reproductive structures of this class is still very imperfect. From some observations made lately on *Ceramiæ*, Dr. Pringsheim is induced to regard the tetraspores as gemmæ, or gonidia. But the capsule-spores germinate in a totally different way,—not growing at once into plants like the parent, but producing an irregular structure, which the author suggests may be a kind of *prothallium*, analogous to that of the Ferns. However, his experiments on the cultivation of these bodies were unsuccessful.

Sphacelaria.—Cladostephus.

Thuret discovered the existence of antheridia in *Cutleria*, containing spermatozoids, very different from the antheridia of *Fucus*. Pringsheim has detected antheridia in *Sphacelaria tubuloides*, more resembling those of *Fucus*. These antheridia consist of one or more large cells formed in the *sphacelæ* at the ends of the branches. Their contents become converted into a quantity of minute roundish bodies, at first much resembling the mass of spermatozoids in the unopened antheridia of the Mosses. The antheridial cell at length grows out laterally into a tube, which breaks through the wall of the *sphacela*, and opens at the point to discharge the mass of spermatozoids. These are very minute clear vesicles, without a brown spot, and in so far resembling those of the Florideæ; but they possess two cilia, like those of the Fucaceæ, and move actively in the same manner. The author had no female plants at command, and consequently could not observe the further history of the reproduction. Somewhat similar antheridia, opening by a tubular process, were observed last summer in *Cladostephus spongiosus*.

Freshwater Algæ.

The author next proceeds to consider the general question of

the reproduction of those Freshwater Algæ in which zoospores form the commonest means of propagation. From the recognition of the contemporaneous existence of zoospores or gonidia with sexual organs of reproduction in *Vaucheria*, he is led to conjecture the existence of a similar condition in other genera. In *Achlya*, both zoospores and resting spores are known, and he suspects that the slender branches found upon those filaments of *Achlya* which bear sporanges, will prove to be antheridia. In *Œdogonium*, the membrane of the sporangial-cell bursts before the formation of the spore-coat, which admits of the possibility of a penetration of spermatozoids. In *Bulbochæte*, a fissure is also met with. Now in these genera, besides resting-spores and ordinary zoospores, we find exceedingly small bodies, resembling the zoospores in their structure, called by A. Braun *microgonidia*. These are developed in cells smaller, and differing in character from the ordinary vegetative cells. They germinate, but produce small bodies, composed only of one or two cells, which, it is remarkable, are always found attached upon the sporangia, or near them. Here they dehisce and discharge their contents. Although no trace of spermatozoids has been perceived in them, this discharge of the contents near the opening of the sporangial membrane tends to the conjecture that they exercise an impregnating influence on the resting-spore. If this be the case, we should have the curious phænomenon of the male structure being developed as a special separate body, a kind of prothallium. With the above peculiarities is associated in *Bulbochæte* a curious mode of germination of the resting-spores. Examples of these kept through the winter produced, not a new filament, but four ciliated zoospores, which escaped, came to rest, germinated, and then produced new filaments. A similar phænomenon was observed in the case of the resting-spores of *Coleochæte*.

The paper concludes by a summing up of the results, which will be unnecessary after this brief abstract.

BIBLIOGRAPHICAL NOTICES.

A History of the British Marine Testaceous Mollusca, distributed in their Natural Order. By William Clark. London: Van Voorst, 1855.

The study of malacology, or of the true natural history of the Mollusca, has sprung up almost entirely within the last half-century. Up to this period the attention of zoologists in this department was almost exclusively directed to the shells of these animals, the only part which admits of being easily preserved in the cabinet or transported from a distance, and the structure of the creatures producing